From "Ban It Till We Understand It" to "Resistance is Futile": How University Programming Instructors Plan to Adapt as More Students Use AI Code Generation and Explanation Tools such as ChatGPT and GitHub Copilot

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Abstract

Over the past year (2022–2023), recently-released AI tools such as ChatGPT and GitHub Copilot have gained significant attention from computing educators. Both researchers and practitioners have discovered that these tools can generate correct solutions to a variety of introductory programming assignments and accurately explain the contents of code. Given their current capabilities and likely advances in the coming years, how do university instructors plan to adapt their courses to ensure that students still learn well? To gather a diverse sample of perspectives, we interviewed 20 introductory programming instructors (9 women + 11 men) across 9 countries (Australia, Botswana, Canada, Chile, China, Rwanda, Spain, Switzerland, United States) spanning all 6 populated continents. To our knowledge, this is the first empirical study to gather instructor perspectives about how they plan to adapt to these AI coding tools that more students will likely have access to in the future. We found that, in the short-term, many planned to take immediate measures to discourage AI-assisted cheating. Then opinions diverged about how to work with AI coding tools longer-term, with one side wanting to ban them and continue teaching programming fundamentals, and the other side wanting to integrate them into courses to prepare students for future jobs. Our study findings capture a rare snapshot in time in early 2023 as computing instructors are just starting to form opinions about this fast-growing phenomenon but have not yet converged to any consensus about best practices. Using these findings as inspiration, we synthesized a diverse set of open research questions regarding how to develop, deploy, and evaluate AI coding tools for computing education.